



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,101	08/26/2003	Bradley L. Todd	2001-IP-005443U2	6428
7590	11/16/2004			
Robert A. Kent Halliburton Energy Services 2600 South 2nd Street Duncan, OK 73536			EXAMINER ZIMMER, MARC S	
			ART UNIT 1712	PAPER NUMBER

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,101

Applicant(s)

TODD ET AL.

Examiner

Marc S. Zimmer

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 9-11, 14, 16-18, 21, 23-26 and 28 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8, 12, 13, 15, 19, 20, 22, 27 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/10/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 9, 11, 16, 18, 23-24, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al., U.S. patent # 5,224,546. They disclose a composition and its utilization as a treating fluid for, among other things, fracturing subterranean formations and gravel packing operations. The composition, which comprises a metal-crosslinked polymer fluid (column 1, lines 64-66) derived from the polymers outlined in column 3, lines 36 to 50, and metal crosslinking compounds of the general types mentioned in column 4, lines 4-7, is degraded when it is desirable to reduce the viscosity of the fluid by incorporating a material that decomposes under certain environmental conditions (high temperature or specific pH according to column 5, lines 1-5) forming (i) an acid that, in turn, degrades the chains of the thickening polymer and (ii) a metal ion chelator that complexes the metal ion thereby breaking up the crosslinks (column 1, lines 64-68 through column 2, lines 1-2). Said decomposable material is an esterified carboxylated chelator including any of those set forth in column 5. In addition to behaving as a compound for degrading the polymer, the acid

generated from the decomposable materials will, of course, have a lowering effect on the pH of the system.

As for claims 4, 11, 18, and 26, the pH at which decrosslinking occurs would be largely a function of the chemical identity of the decomposable material but also would be influenced by the chemical identities of the aforementioned polymer and crosslinker. Insofar as (a) the claimed decomposable materials, like those of the instant invention, are hydrolyzed into organic acids that actively destroy the polymer and (b) the polymers and crosslinkers contemplated in Applicant's disclosure are similar to those taught by the reference, the limitation recited in each of the above claims is inherently anticipated.

Claims 1-4, 7, 9-11, 14, 16-18, 21, 23-26, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Dawson et al., U.S. Patent # 6,793,018. Like Smith, Dawson discloses a composition having utility for hydraulic fracturing and gravel packing operations (column 8, lines 61-64) comprising a crosslinked polymer and an ester compound. As before, the ester compound dissociates into a carboxylic acid and alcohol under particular environmental conditions and the acid works synergistically with an inorganic oxidant/breaking agent to degrade the polymer thereby reducing fluid viscosity (paragraph bridging columns 2 and 3). Embodiments of the ester compound, inorganic breaking agent, and crosslinking compound are offered in column 3, lines 28-58. The crosslinkable polymers are generally polysaccharides including those outlined in column 5, lines 16-25 but may also be hydratable synthetic polymers such as polyacrylamide and polyvinyl alcohol (column 5, lines 29-31). The rate at which the ester is hydrolyzed into the acid necessary for polymer degradation is influenced by

Art Unit: 1712

considerations not easily manipulated in practice including temperature and fluid pH but may also be controlled by the quantity of ester and, in high temperature applications, the presence of a hydrocarbon solvent (column 8, lines 24-29).

The same rationale applied earlier with respect to claims 4, 11, 18, and 26 in the rejection over Smith is also relevant here.

Claims 1-4, 9-11, and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Harris et al., U.S. patent # 5,813,466. The teachings of Harris are analogous to those of Smith and Dawson inasmuch as they disclose the utilization of a precursor as a source of latent acid to degrade a crosslinked polymer. As in the other cases, the crosslinked polymer is employed in a fracturing composition (column 6, lines 1-3). Constituents of the crosslinked polymer are the polysaccharides and water-soluble organic polymers mentioned in column 3, lines 1-31, and the crosslinking agents listed in column 4, lines 1-56. Whereas Dawson used a synergistic combination of an inorganic oxidant and an ester to promote degradation of the polymer thereby yielding a reduction in the viscosity of the composition, Harris teaches the addition of an enzyme that facilitates slow hydrolysis of the ester into an alcohol and the acid needed to bring about polymer degradation (column 2, lines 36-47 and column 5, lines 18-27).

Concomitant with carboxylic acid formation is, of course, a lowering in the pH of the crosslinked polymer-containing fluid.

The same rationale applied earlier with respect to claims 4, 11, and 26 in the rejection over Smith is also relevant here.

Allowable Subject Matter

Claims 5-6, 8, 12-13, 15, 19-20, 22, 27-27, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In none of the relevant prior art was it contemplated to convert any of the materials mentioned in these claims into an acid that would bring about a lowering of pH/degradation of the crosslinked polymer. Still et al., U.S. Patent Application Publication No. 2004/0152601 discloses the utilization of lactides, polylactides, glycolides, etc. as materials for acid fracturing but this is a fundamentally different technique from the gel-based fracturing techniques presently claimed.

There are numerous other patent documents that disclose inventions similar to the instant invention including U.S. Patent Nos. 5,067,566, 5,460,226, 4,961,466, 3,960,736, and 4,848,467. These references teach no more of the instant invention than the references already applied herein and will not be used as a foundation for rejection at this juncture.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 9, 2004

Marc Zimmer

Marc Zimmer
AV 1712